

other nucleuses and stops its growth. An amorphous silicon thin film is crystallized by a number of crystallites having a needle shape. Applicants submit that they may be their own lexicographers and the material added into the specification and the claims in the response filed on November 20, 2001 is supported in the specification. Applicants respectfully disagree that the Figures of this application show a "stick-like picture" as described by the Examiner and request that the objection under 35 USC § 132 be withdrawn.

The Examiner rejected claims 1-7 and 9 under 35 USC § 103(a) as being unpatentable over Ohtani et al. (US Patent No. 5,612,250) in view of Fonash et al. (US Patent No. 5,994,164). Applicants respectfully traverse this rejection.

For the record, neither a copy of the Fonash et al. reference nor a copy of PTO-982 were provided with the final Office Action, and the PTO-892 box was not checked on the Office Action Summary (PTO-326).

Claims 1-5 are allowable over the cited reference in that these claims recite a combination of elements including, for example, a polycrystalline silicon film containing Ni atoms; an electrical conductivity activation energy between 0.52 eV and 0.71 eV and a plurality of needle-shaped silicon crystallites. Claims 6, 7 and 9 are allowable over the cited reference in that these claims recite a combination of elements including, for example, a polycrystalline silicon film containing metal; an electrical conductivity activation energy between 0.52 eV and 0.71 eV and a plurality of needle-shaped silicon crystallites. None of the cited references, singly or combined, teaches or suggests these features of the present invention.

On page 4 of the Final Office Action, the Examiner states that "[t]he polycrystalline silicon film [of Ohtani et al.] comprises a plurality of bar-like silicon crystallites (fig. 2c),

due to the way the crystal are grown and inherently forms the patterned feature (col. 8, lines 2-13 and col. 20, lines 35-41)” However, Applicants submit that Ohtani et al. does not describe the shape of the crystals of his invention. In contrast, claim 1 recites at least a polycrystalline silicon film comprising a plurality of needle-shaped silicon crystals.

Applicants submit that the crystallites, as recited by at least claim 1 have a “needle shape” and none of the cited references teaches or suggests these features.

The Examiner acknowledges that Ohtani et al. does not disclose the claimed activation energy. The Examiner cites Fonash et al. to cure the deficiencies of Ohtani et al. Fonash et al. fails to cure the deficiencies of Ohtani et al. because it does not teach or suggest a plurality of needle shaped crystallites.

In view of these distinguishing features, Applicant submits that there is no teaching or suggestion in the cited references to develop the polycrystalline silicon film as recited in independent claims 1, 3, 6, and 9. Applicant further submits that claims 2, 4, 5, and 7 are allowable over the cited references at least because they depend from claims 1, 3, 6, and 9, respectively, which are believed to be allowable. Therefore, Applicant respectfully submits that claims 1-7, and 9 are allowable over the cited references.

Minor changes have been made to the specification. No new matter has been added.

Applicants believe the foregoing amendments place the application in condition for allowance and early, favorable action is respectfully solicited. Should the Examiner deem that a telephone conference would further the prosecution of this application, the Examiner is invited to call the undersigned attorney at (202) 624-1200.

If these papers are not considered timely filed by the Patent and Trademark Office, then a petition is hereby made under 37 C.F.R. §1.136. Please credit any overpayment to deposit Account No. 50-0911.

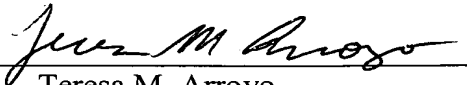
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Group Art Unit: 2814

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Respectfully submitted,

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Date: April 15, 2002

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MARKED UP VERSION SHOWING SPECIFICATION CHANGES

Page 9, paragraph beginning at line 10:

Referring to Fig. 11C, it is noted that the film is crystallized by crystallites 13 of a [bar-like shape] needle shape, and the whole amorphous silicon is crystallized uniformly.

Page 9, paragraph beginning at line 14:

Referring to Fig. 11D, [bar-like] needle shaped crystallites are not identified in the drawing, and the whole film is filled with crystallites 14 of a small circle-like shape. Such polysilicon fails to be used for fabricating solar cells, thin film transistors, and the like.

Page 9, paragraph beginning at line 27:

As mentioned in the above description of the present invention, a polysilicon film containing Ni having a density in the range of [[ranges]] 2×10^{17} and 5×10^{19} atoms/cm³ consists of [bar-like] needle shaped silicon crystallites, and the whole part of the polysilicon film is crystallized uniformly.

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